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(54) Fuse box, fuse, and fuse block

(57) A fuse block 1 includes a fuse box 2 and a high voltage fuse 3. The fuse box 2 has a high voltage mounting part 6. The high voltage mounting part 6 is provided with an opening 6a, a plurality of surrounding walls 7a, 7b, and projections 8. Each of the projections 8 is projected from both the surrounding walls 7a, 7b which are adjacent to each other into an interior of the high voltage mounting part 6. A rated voltage fuse cannot be mounted to the high voltage mounting part 6 because of the presence of the projections 8. The high voltage fuse 3 includes a housing 10 having outer walls 14a, 14b and recesses 13. Each of the recesses 13 is formed by denting both the outer walls 14a, 14b which are adjacent to each other. When the high voltage fuse 3 is mounted to the high voltage mounting part 6, the recesses 13 and the projections 8 will not interfere with each other.

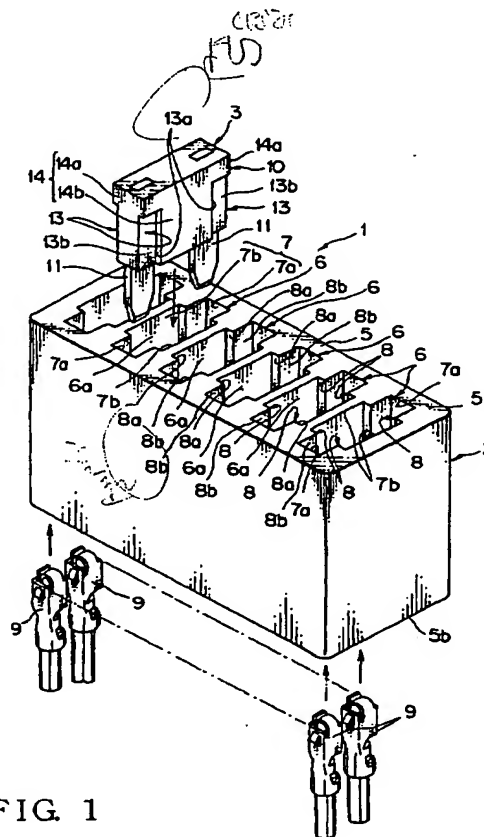


FIG. 1

Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a fuse box, a fuse, and a fuse block to be installed in a vehicle which is a moving body.

Description of the Related Art

[0002] In the vehicle as the moving body, there are various transmission lines for transmitting electric power, signals and so on, such as busbars contained in a connection box such as a junction block, a relay box, a fuse block, terminals of electrical connector, etc.

[0003] Heretofore, a voltage of the electric power for use in the transmission lines has been mainly 12V in case of a general passenger automobile, and has been 12V x 2 = 24V in case of a large vehicle such as a bus, a truck, etc. However, in view of recent requests for an increase in driving efficiency of loads and for driving at most appropriate efficiency per the load, it has started to be considered to employ a power system capable of supplying the electric power having higher voltage than before, such as 36V for example.

[0004] In the above described transmission lines, there have been used fuse blocks in which a number of detachable fuses are disposed for protecting electric circuits of various types of electric equipments from breakdown. Since the fuse block may sometimes include relays and busbars, the fuse block is also called as a relay box or a junction block, or generally called as a connection box. In this specification, the fuse block, relay box, junction box and connection box will be hereinafter called as the fuse block in general.

[0005] In the vehicle in which employment of the power system capable of supplying the electric power having higher voltage than before as described above is intended, it is considered to employ a fuse block provided with a first fuse (hereinafter referred to as a high voltage fuse) and a fuse box having a first mounting part to which the high voltage fuse can be detachably mounted. The fuse block is supplied with the electric power having a first voltage such as 36V higher than 32V which has been conventionally employed. The high voltage fuse is adapted to be fused when the electric power above an amperage corresponding to the first voltage has been supplied and interrupts the supply of the power to the various loads.

[0006] Meanwhile, in the vehicle installed with the conventional power system which supplies the electric power of 12V and 24V, a fuse block provided with a second fuse (hereinafter referred to as a rated voltage fuse) and a fuse box having a second mounting part to which the rated voltage fuse can be detachably mounted is employed. The above described rated voltage fuse is

supplied with the electric power having a second voltage such as 12V and 24V which is lower than the aforesaid first voltage. The rated voltage fuse is adapted to be fused when the electric power above an amperage corresponding to the second voltage has been supplied and interrupts the supply of the power to the various loads.

[0007] The fuse block, fuse box and fuse which have been heretofore employed are constructed in such a manner that the rated voltage fuse can be also mounted to the first mounting part.

[0008] For this reason, when assembling the fuse block to be installed in the vehicle in which employment of the power system capable of supplying the power having higher voltage than before is intended, there has been such a fear that the rated voltage fuse may be mounted to the first mounting part by mistake.

[0009] If the rated voltage fuse has been mounted to the first mounting part, such an inconvenience may occur that the rated voltage fuse may be fused and the loads may not be supplied with the power, even though the voltage of the power which is supplied to the loads connected to the first mounting part is normal. In some cases, a fusible body of the rated voltage fuse may be blown off due to the high amperage, and terminals of the rated voltage fuse may be short circuited to each other.

[0010] When the terminals of the rated voltage fuse have been short circuited to each other, it is feared that the rated voltage fuse and the fuse block may be melted down and broken. In the worst case, the loads connected to the first mounting part may be damaged.

[0011] As described above, in the conventional structure of the fuse block, fuse box and fuse, in case where the rated voltage fuse of the conventional use has been mounted to the mounting part to be supplied with the power having the first voltage over 32V, it has been feared that the loads may not be supplied with the power even though the voltage of the power supplied to the loads is normal, or that the fuse block and the fuse itself may be melted and broken.

[0012] In view of the above, an object of the invention is to provide a fuse box, a fuse, and a fuse block which can prevent the fuse adapted to be fused at the amperage corresponding to the voltage which has been conventionally used from being mounted to the mounting part which is supplied with the electric power having higher voltage than before.

SUMMARY OF THE INVENTION

[0013] In order to solve the above described problems and attain the object, according to a first aspect of the present invention, there is provided a fuse box comprising a box body formed in a box-like shape, and at least one first mounting part adapted to contain a pair of first receiving terminals which are arranged in parallel to each other, one of the first receiving terminals being sup-

plied with electric power having a first voltage higher than 32V, wherein the first mounting part includes blocking means for preventing a rated voltage fuse which is so adapted as to fuse at an amperage corresponding to a second voltage which is lower than the first voltage from being mounted thereto.

[0014] In the fuse box according to the first aspect, the blocking means block the rated voltage fuse from being mounted to the first mounting part which contains the first receiving terminals and is supplied with the electric power having the first voltage higher than 32V. Accordingly, the rated voltage fuse can be prevented from being mounted to the first mounting part.

[0015] In the fuse box according to a second aspect of the present invention, the first mounting part is formed by denting a surface of the box body, including an opening which opens in the surface of the box body and a plurality of surrounding walls continued from peripheral edges of the opening, and the blocking means include projections which are projected from the surrounding walls into the first mounting part.

[0016] In the fuse box according to the second aspect, because the blocking means are the projections projected from the surrounding walls which constitute the first mounting part, the projections are abutted against the rated voltage fuse when the rated voltage fuse is mounted to the first mounting part. Thus, the rated voltage fuse can be more reliably prevented from being mounted to the first mounting part.

[0017] In the fuse box according to a third aspect of the invention, the surrounding walls of the first mounting part include a pair of first surrounding walls which are opposed to each other in a direction in which the first receiving terminals are juxtaposed, and a pair of second surrounding walls which are continued from the first surrounding walls and opposed to each other in a direction intersecting the direction in which the first receiving terminals are juxtaposed, and the projections are formed by convexing from both the first surrounding walls and the second surrounding walls which are adjacent to each other across the first surrounding walls and second surrounding walls.

[0018] In the fuse box according to the third aspect, because the projections are projected across the first surrounding walls and the second surrounding walls which constitute the first mounting part, the projections are reliably abutted against the rated voltage fuse when the rated voltage fuse is mounted to the first mounting part. Thus, the rated voltage fuse can be more reliably prevented from being mounted to the first mounting part.

[0019] There is further provided, according to a fourth aspect of the present invention, a fuse comprising a pair of connecting terminals arranged in parallel to each other, one of the connecting terminals being capable of supplying electric power having a first voltage higher than 32V, and a housing adapted to receive one end portions of the connecting terminals, wherein the housing includes outer walls forming an outer shell, and recesses

formed by denting surfaces of the outer walls.

[0020] In the fuse according to the fourth aspect, the housing is provided with the recesses formed by denting the surfaces of the outer walls. Therefore, by providing the mounting part for the fuse with projections or the like which will not interfere with the recesses, the rated voltage fuse which has been conventionally used can be prevented from being mounted to the mounting part.

[0021] In the fuse according to a fifth aspect of the invention, the outer walls of the housing include a pair of first outer walls which are opposed to each other in a direction in which the first connecting terminals are juxtaposed, and a pair of second outer walls which are continued from the first outer walls and opposed to each other in a direction intersecting the direction in which the first connecting terminals are juxtaposed, and the recesses are formed by denting the first outer walls and the second outer walls which are adjacent to each other across the first outer walls and second outer walls.

[0022] In the fuse according to the fifth aspect, the housing has the first outer walls and the second outer walls, and the recesses are formed across the first outer walls and the second outer walls. Therefore, by providing the mounting part for the fuse with projections or the like which will not interfere with the recesses, the rated voltage fuse which has been conventionally used can be prevented from being mounted to the mounting part.

[0023] There is further provided, according to a sixth aspect of the present invention, a fuse block comprising a box body formed in a box-like shape and a first mounting part adapted to receive a pair of first receiving terminals which are arranged in parallel to each other, one of the first receiving terminals being supplied with electric power having a first voltage higher than 32V, a second mounting part adapted to receive a pair of second receiving terminals which are arranged in parallel to each other, one of the second receiving terminals being supplied with electric power having a second voltage lower than the first voltage, a first fuse having a pair of first connecting terminals which are arranged in parallel to each other and adapted to be respectively connected to the first receiving terminals, and a first fusible body which is adapted to fuse when the electric power whose amperage is higher than a value corresponding to the first voltage has been supplied, the first fuse being adapted to be detachably mounted to the first mounting part, and a second fuse having a pair of second connecting terminals which are arranged in parallel to each other and adapted to be respectively connected to the second receiving terminals, and a second fusible body which is adapted to fuse when electric power whose amperage is higher than a value corresponding to the second voltage has been supplied, the second fuse being adapted to be detachably mounted to the second mounting part, wherein the first mounting part is formed by denting a surface of the box body, including an opening which opens in the surface of the box body, a plurality of surrounding walls continued from peripheral edges of

the opening, and projections which are projected from the surrounding walls into the first mounting part, and the first fuse includes the pair of the first connecting terminals, a housing adapted to receive one end portions of the first connecting terminals and including outer walls forming an outer shell, and recesses which are formed by denting surfaces of the outer walls and may not interfere with the projections.

[0024] In the fuse block according to the sixth aspect, the first mounting part is provided with the projections projected from the surrounding walls. Accordingly, the second fuse cannot be mounted to the first mounting part. Meanwhile, the first fuse is provided with the recesses which are dented from the outer walls and may not interfere with the projections. Accordingly, the first fuse can be reliably mounted to the first mounting part.

[0025] In the fuse block according to a seventh aspect of the invention, the surrounding walls of the first mounting part include a pair of first surrounding walls which are opposed to each other in a direction in which the first receiving terminals are juxtaposed, and a pair of second surrounding walls which are continued from the first surrounding walls and opposed to each other in a direction intersecting the direction in which the first receiving terminals are juxtaposed, the outer walls of the housing include a pair of first outer walls which are opposed to each other in a direction in which the first connecting terminals are juxtaposed, and a pair of second outer walls which are continued from the first outer walls and opposed to each other in a direction intersecting the direction in which the first connecting terminals are juxtaposed, the projections are formed by convexing from the first surrounding walls and the second surrounding walls which are adjacent to each other across the first surrounding walls and second surrounding walls, and the recesses are formed by denting the first outer walls and the second outer walls which are adjacent to each other across the first outer walls and the second outer walls.

[0026] In the fuse block according to the seventh aspect, the projections are formed across the first surrounding walls and the second surrounding walls adjacent to each other. Therefore, the second fuse can be prevented from being mounted to the first mounting part, and the first fuse can be reliably mounted to the first mounting part.

[0027] In the fuse block according to an eighth aspect of the invention, the projections and the recesses come into alignment with each other when the first fuse has been mounted to the first mounting part.

[0028] In the fuse box according to the eighth aspect, because the projections and the recesses come into alignment with each other, the first fuse can be more reliably mounted to the first mounting part.

BRIEF DESCRIPTION OF THE DRAWINGS

[0029]

Fig. 1 is a perspective view showing a structure of a fuse block according to a first embodiment of the present invention;

Fig. 2 is a perspective view showing a high voltage fuse in the embodiment of Fig. 1;

Fig. 3A is a view of the high voltage fuse as seen from a direction of an arrow IIIA of Fig. 2;

Fig. 3B is a view of the high voltage fuse as seen from a direction of an arrow IIIB of Fig. 2;

Fig. 4 is a perspective view of a rated voltage fuse;

Fig. 5A is a view of the rated voltage fuse as seen from a direction of an arrow VA of Fig. 4;

Fig. 5B is a view of the rated voltage fuse as seen from a direction of an arrow VB of Fig. 4;

Fig. 6 is a perspective view showing the high voltage fuse mounted on a high voltage mounting part of the fuse box as shown in Fig. 1;

Fig. 7 is a perspective view showing the rated voltage fuse which is being mounted on the high voltage mounting part of the fuse box as shown in Fig. 1;

Fig. 8 is a sectional view taken along a line VIII-VIII of Fig. 6;

Fig. 9 is a sectional view taken along a line IX-IX of Fig. 7;

Fig. 10 is a perspective view showing a structure of a fuse block according to a second embodiment of the present invention; and

Fig. 11 is a perspective view wherein both the rated voltage fuse and the high voltage fuse have been mounted on the rated voltage mounting part of the fuse box as shown in Fig. 10.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0030] Now, the first embodiment according to the present invention will be described referring to Figs. 1 to 3, and Figs. 6 to 9. A fuse block 1 according to the first embodiment has a fuse box 2 and a high voltage fuse 3 as shown in Fig. 1 and so on.

[0031] The fuse box 2 includes a box body 5, and a plurality of high voltage mounting parts 6 as a first mounting part. Each of the high voltage mounting parts 6 has a terminal insertion bore 6b which extends from an opening 6a formed in one surface 5a of the box body 5 to the other surface 5b positioned at an opposite side of the surface 5a (See Figs. 8 and 9).

[0032] A pair of high voltage receiving terminals 9 (See Fig. 1) are inserted into the high voltage mounting part 6 through the terminal insertion bore 6b. These pair of the high voltage receiving terminals 9 correspond to first receiving terminals described in the claims.

[0033] One of the high voltage receiving terminals 9

is electrically connected to a high voltage power source which supplies power having a first voltage, for example, of 36V. The other of the high voltage receiving terminals 9 is electrically connected to a large capacity load, such as an igniter, a wiper motor, a heat wire defogger of a rear window, a window motor of a door trim, etc. having a rated voltage capacity of the aforesaid first voltage. In this manner, one of the high voltage receiving terminals 9 is supplied with the power having the first voltage over 32V.

[0034] The high voltage mounting part 6 has an opening 6a formed in one surface 5a of the box body 5, a plurality of surrounding walls 7 continued from peripheral edges of the opening 6a, and projections 8 as blocking means. the opening 6a is formed in a substantially rectangular shape in a plan view.

[0035] The surrounding walls 7 include first surrounding walls 7a which are opposed to each other in a direction in which the high voltage receiving terminals 9 are juxtaposed, and second surrounding walls 7b which are opposed to each other in a direction perpendicular to the direction in which the high voltage receiving terminals 9 are juxtaposed. Surfaces of both the first and the second surrounding walls 7a, 7b are substantially flat.

[0036] The projections 8 are provided at corners between the first surrounding walls 7a and the second surrounding walls 7b respectively. In the illustrated embodiment, the projections 8 are provided at the four corners of the opening 6a. Each of the projections 8 has a first wall 8a projected from the second surrounding wall 7b and a second wall 8b projected from the first surrounding wall 7a.

[0037] The first wall 8a projects into an interior of the high voltage mounting part 6 and formed flat in parallel to the first surrounding wall 7a. The second wall 8b projects into an interior of the high voltage mounting part 6 and formed flat in parallel to the second surrounding wall 7b.

[0038] The high voltage fuse assembly 3 is detachably mounted in the high voltage mounting part 6 through the opening 6a. As shown in Figs. 1 to 3, the high voltage fuse 3 includes a pair of first connecting terminals 11, a housing 10, a first fusible body 12, and recesses 13.

[0039] The first connecting terminals 11 are respectively formed of electrically conductive metal in a substantially blade-like shape. The pair of the first connecting terminals 11 are arranged in parallel to each other. When the high voltage fuse 3 has been mounted to the high voltage mounting part 6, the first connecting terminals 11 are respectively connected to the pair of the high voltage receiving terminals 9. One of the first connecting terminals 11 is supplied with the electric power having the aforesaid first voltage.

[0040] The housing 10 is made of insulating synthetic resin or the like, and formed in a box-like shape for containing respective one end portions of the first connecting terminals 11.

[0041] The housing 10 includes first outer walls 14a

which are opposed to each other in a direction in which the pair of the first connecting terminals 11 are juxtaposed, and second outer walls 14b which are opposed to each other in a direction intersecting (at right angle in this embodiment) the direction in which the pair of the first connecting terminals 11 are juxtaposed.

[0042] Surfaces of both the first and second outer walls 14a and 14b are formed flat.

[0043] When the high voltage fuse 3 has been mounted to the high voltage mounting part 6, the first outer walls 14a are opposed to the first surrounding walls 7a, and the second outer walls 14b are opposed to the second surrounding walls 7b.

[0044] The first fusible body 12 interconnects the pair of the first connecting terminals 11 within the housing 10. The first fusible body 12 is so adapted to be fused when an amperage of the electric power fed from one of the first connecting terminals 11 has exceeded a threshold value corresponding to the first voltage.

[0045] The recesses 13 are provided at corners of the housing 10 where the first outer walls 14a are connected to the second outer walls 14b. In the illustrated embodiment, the recesses 13 are provided at the four corners of the housing 10. Each of the recesses 13 includes a first wall 13a formed in a flat face and dented from the first outer wall 14a in parallel thereto, and a second wall 13b formed in a flat face and dented from the second outer wall 13b in parallel thereto.

[0046] As described, the recess 13 is formed by denting both the first outer wall 14a and the second outer wall 14b which are adjacent to each other.

[0047] When the high voltage fuse 3 has been mounted to the high voltage mounting part 6, the first walls 13a are opposed to the first projecting walls 8a, and the second walls 13b are opposed to the second projecting walls 8b. The recesses 13 will not interfere with the projections 8 when the high voltage fuse 3 has been mounted to the high voltage mounting part 6, and will be in alignment with the projections 8 with their walls 13a, 13b opposed to the walls 8a, 8b respectively.

[0048] According to the above described structure, the fuse block 1 in this embodiment receives the high voltage receiving terminals 9 by inserting them into the fuse box 2 through the terminal insertion opening 6b. The high voltage fuse 3 is mounted and detached through the opening 6a of the high voltage mounting part 6. When the high voltage fuse 3 has been mounted to the high voltage mounting part 6, the high voltage receiving terminals 9 and the first connecting terminals 11 are connected to each other.

[0049] In a state where the high voltage receiving terminals 9 and the first connecting terminals 11 are connected to each other, when the amperage of the current fed from the high voltage power source has exceeded the amperage corresponding to the first voltage, the first fusible body 12 will be fused. Thus, the supply of the electric power to the load connected the other first connecting terminal 11 and the high voltage receiving ter-

terminal 9 will be interrupted.

[0050] According to the present embodiment, the high voltage mounting part 6 is provided with the projections 8 projected from the surrounding walls 7a, 7b. For this reason, such an error that the rated voltage fuse 4 as the second fuse which is shown in Figs. 4 and 5 may be mounted to the high voltage mounting part 6 can be avoided. The projections 8 will interfere a housing 20 of the rated voltage fuse 4 to prevent the rated voltage fuse 4 from being mounted to the high voltage mounting part 6.

[0051] The rated voltage fuse 4 includes second connecting terminals 21, the second housing 20 and a second fusible body 22 as shown in Figs. 4 and 5. The second connecting terminals 21 are made of electrically conductive metal and respectively formed in a blade-like shape. The second connecting terminals 21 are arranged in parallel to each other.

[0052] The second housing 20 is made of insulating synthetic resin or the like and formed in a box-like shape. One end portions of the second connecting terminals 21 are contained in the second housing 20.

[0053] The second fusible body 22 is contained in the second housing 20 and interconnects the pair of the second connecting terminals 21. When the amperage of the current fed through one of the second connecting terminals 21 has exceeded the second amperage corresponding to the second voltage of 12V or 24V, for example, which is lower than the aforesaid first voltage, the second fusible body 22 will be fused.

[0054] Further, according to this embodiment, the recesses 13 will not interfere but align with the projections 8, the high voltage fuse 3 can be reliably mounted to the high voltage mounting part 6. Accordingly, only the high voltage fuse 3 can be mounted to the high voltage mounting part 6 in this embodiment.

[0055] As described, the structure of the fuse block 1 and the fuse box 2 enable the high voltage fuse 3 to be reliably mounted to the high voltage mounting part 6, and prevent the rated voltage fuse 4 from being mounted to the high voltage mounting part 6. Accordingly, the electric power can be reliably supplied to the load connected to the high voltage receiving terminal 9, and at the same time, such a fear that the rated voltage fuse may be melted down resulting in a breakdown of the fuse box 2 or so can be avoided.

[0056] Now, a second embodiment of the present invention will be described referring to Figs. 10 and 11. The same components as those of the first embodiment will be denoted with the same reference numerals, and their explanation will be omitted.

[0057] The fuse block 1 in the present embodiment consists of the fuse box 2, the high voltage fuse 3, the rated voltage fuse 4, and so on. The fuse box 2 is formed in a box-like shape, and includes a plurality of the high voltage mounting parts 6, and a plurality of rated voltage mounting parts 26 as second mounting parts.

[0058] Each of the rated voltage mounting parts 26 is

provided with a terminal insertion hole (not shown) formed on a surface 5b of the box body 5. A pair of rated voltage receiving terminals 29 as shown in Fig. 10 are inserted into the rated voltage mounting part 26. These pair of the rated voltage receiving terminals 29 constitute second receiving terminals described in the claims.

[0059] One of the rated voltage receiving terminals 29 is electrically connected to a rated voltage power source which supplies the electric power having the second voltage of 12V or 24V, for example, which is lower than the first voltage. The other of the rated voltage receiving terminals 29 is electrically connected to an ordinary load having the second voltage as a rated capacity, such as conventionally known lamps at a vehicle head and tail, horns, various meters installed on an instrument panel, accessories, a room lamp, etc. In this manner, one of the rated voltage receiving terminals 29 is supplied with the electric power having the second voltage which is lower than the first voltage.

[0060] The rated voltage mounting part 26 includes an opening 26a which opens in a face 5a of the box body 5, and a plurality of surrounding walls 27 continued from peripheral edges of the opening 26a as shown in Fig. 10.

[0061] As shown in Fig. 11, both the high voltage fuse 3 and the rated voltage fuse 4 can be mounted in the rated voltage mounting part 26 through the opening 26a. When the rated voltage fuse 4 has been mounted in the rated voltage mounting part 26, the second connecting terminals 21 are respectively connected to the rated voltage receiving terminals 29.

[0062] In the fuse block 1 of this embodiment, the high voltage mounting part 6 is provided with the projections 8 which blocks the rated voltage fuse 4 from being mounted, and the high voltage fuse 3 is provided with recesses 13 which will not interfere with the projections 8. Therefore, only the high voltage fuse 3 can be inserted into the high voltage mounting part 6.

[0063] When assembling the fuse box 1, it should be tried as a first step, to insert the rated voltage fuses 4 into all the mounting parts 6, 26. Then, the rated voltage fuses 4 can be inserted only into the rated voltage mounting parts 26. Thereafter, into the remaining high voltage mounting parts 6, are inserted the high voltage fuses 3. According to such assembling method, the high voltage fuses 3 can be reliably inserted into the high voltage mounting parts 6, while the rated voltage fuses 4 only can be reliably inserted into the rated voltage mounting parts 26.

[0064] Accordingly, the high voltage fuses 3 and the rated voltage fuses 4 which are adapted to fuse at different voltages can be reliably mounted in the high voltage mounting parts 6 and the rated voltage mounting parts 26 respectively.

[0065] In the same manner as in the first embodiment, the high voltage fuses 3 can be reliably mounted in the high voltage mounting parts 6, and the rated voltage fuses 4 can be prevented from being mounted in the high voltage mounting parts 6. Therefore, the electric power

can be reliably fed to the loads connected to the high voltage receiving terminals 9, and at the same time, such a fear that the rated fuses may be melted down resulting in a breakdown of the fuse box 2 can be avoided.

[0066] Further, the high voltage fuses 3 can be mounted in both the high voltage mounting parts 6 and the rated voltage mounting parts 26. Therefore, the electric power can be reliably supplied to the various loads, even though the high voltage fuses 3 only are used in the fuse box 1 having a plurality of the high voltage mounting parts 6 and a plurality of the rated voltage mounting parts 26 which are fed with the electric powers having different voltages.

[0067] Accordingly, in the fuse box 1 having a plurality of the high voltage mounting parts 6 and a plurality of the rated voltage mounting parts 26 which are fed with the electric powers having different voltages, types of the components can be restrained.

[0068] Furthermore, when assembling the fuse box 1 having a plurality of the high voltage mounting parts 6 and a plurality of the rated voltage mounting parts 26 which are fed with the electric powers having different voltages, there will be no need of identifying types of the fuses.

[0069] Although the present invention has been fully described by way of examples with reference to the accompanying drawings, it is to be noted that various changes and modifications can be made within the scope of the present invention.

Claims

1. A fuse box comprising:

a box body formed in a box-like shape; and at least one first mounting part adapted to contain a pair of first receiving terminals which are arranged in parallel to each other, one of said first receiving terminals being supplied with electric power having a first voltage higher than 32V, wherein said first mounting part includes blocking means for preventing a rated voltage fuse which is so adapted as to fuse at an amperage corresponding to a second voltage which is lower than said first voltage from being mounted thereto.

2. The fuse box as claimed in claim 1, wherein said first mounting part is formed by denting a surface of said box body, including an opening which opens in said surface of the box body and a plurality of surrounding walls continued from peripheral edges of said opening, and

said blocking means include projections which are projected from said surrounding walls into said first mounting part.

3. The fuse box as claimed in claim 2, wherein said surrounding walls of said first mounting part include a pair of first surrounding walls which are opposed to each other in a direction in which said first receiving terminals are juxtaposed, and a pair of second surrounding walls which are continued from said first surrounding walls and opposed to each other in a direction intersecting the direction in which said first receiving terminals are juxtaposed, and

said projections are formed by convexing from both said first surrounding walls and said second surrounding walls which are adjacent to each other across said first surrounding walls and second surrounding walls.

4. A fuse comprising:

a pair of connecting terminals arranged in parallel to each other, one of said connecting terminals being used for supplying an electric power having a first voltage higher than 32V; and

a housing adapted to receive one end portions of said connecting terminals, wherein said housing includes outer walls forming an outer shell, and recesses formed by denting surfaces of said outer walls.

5. The fuse as claimed in claim 4, wherein said outer walls of the housing include a pair of first outer walls which are opposed to each other in a direction in which said first connecting terminals are juxtaposed, and a pair of second outer walls which are continued from said first outer walls and opposed to each other in a direction intersecting the direction in which said first connecting terminals are juxtaposed, and

said recesses are formed by denting said first outer walls and said second outer walls which are adjacent to each other across said first outer walls and second outer walls.

6. A fuse block comprising:

a box body formed in a box-like shape; and a first mounting part adapted to receive a pair of first receiving terminals which are arranged in parallel to each other, one of said first receiving terminals being supplied with electric power having a first voltage higher than 32V; a second mounting part adapted to receive a pair of second receiving terminals which are arranged in parallel to each other, one of said second receiving terminals being supplied with electric power having a second voltage lower than said first voltage; a first fuse having a pair of first connecting terminals which are arranged in parallel to each

other and adapted to be respectively connected to said first receiving terminals, and a first fusible body which is adapted to fuse when the electric power whose amperage is higher than a value corresponding to said first voltage has been supplied, said first fuse being adapted to be detachably mounted to said first mounting part, and

a second fuse having a pair of second connecting terminals which are arranged in parallel to each other and adapted to be respectively connected to said second receiving terminals, and a second fusible body which is adapted to fuse when electric power whose amperage is higher than a value corresponding to said second voltage has been supplied, said second fuse being adapted to be detachably mounted to said second mounting part,

wherein said first mounting part is formed by denting a surface of said box body, including an opening which opens in said surface of the box body, a plurality of surrounding walls continued from peripheral edges of said opening, and projections which are projected from said surrounding walls into said first mounting part, and said first fuse includes said pair of the first connecting terminals, a housing adapted to receive one end portions of said first connecting terminals and including outer walls forming an outer shell, and recesses which are formed by denting surfaces of said outer walls and may not interfere with said projections.

7. The fuse block as claimed in claim 6, wherein said surrounding walls of said first mounting part include a pair of first surrounding walls which are opposed to each other in a direction in which said first receiving terminals are juxtaposed, and a pair of second surrounding walls which are continued from said first surrounding walls and opposed to each other in a direction intersecting the direction in which said first receiving terminals are juxtaposed,

said outer walls of the housing include a pair of first outer walls which are opposed to each other in a direction in which said first connecting terminals are juxtaposed, and a pair of second outer walls which are continued from said first outer walls and opposed to each other in a direction intersecting the direction in which said first connecting terminals are juxtaposed, said projections are formed by convexing from said first surrounding walls and said second surrounding walls which are adjacent to each other across said first surrounding walls and second surrounding walls, and said recesses are formed by denting said first outer walls and said second outer walls which

are adjacent to each other across said first outer walls and said second outer walls.

8. The fuse block as claimed in claim 7, wherein said projections and said recesses come into alignment when said first fuse has been mounted to said first mounting part.

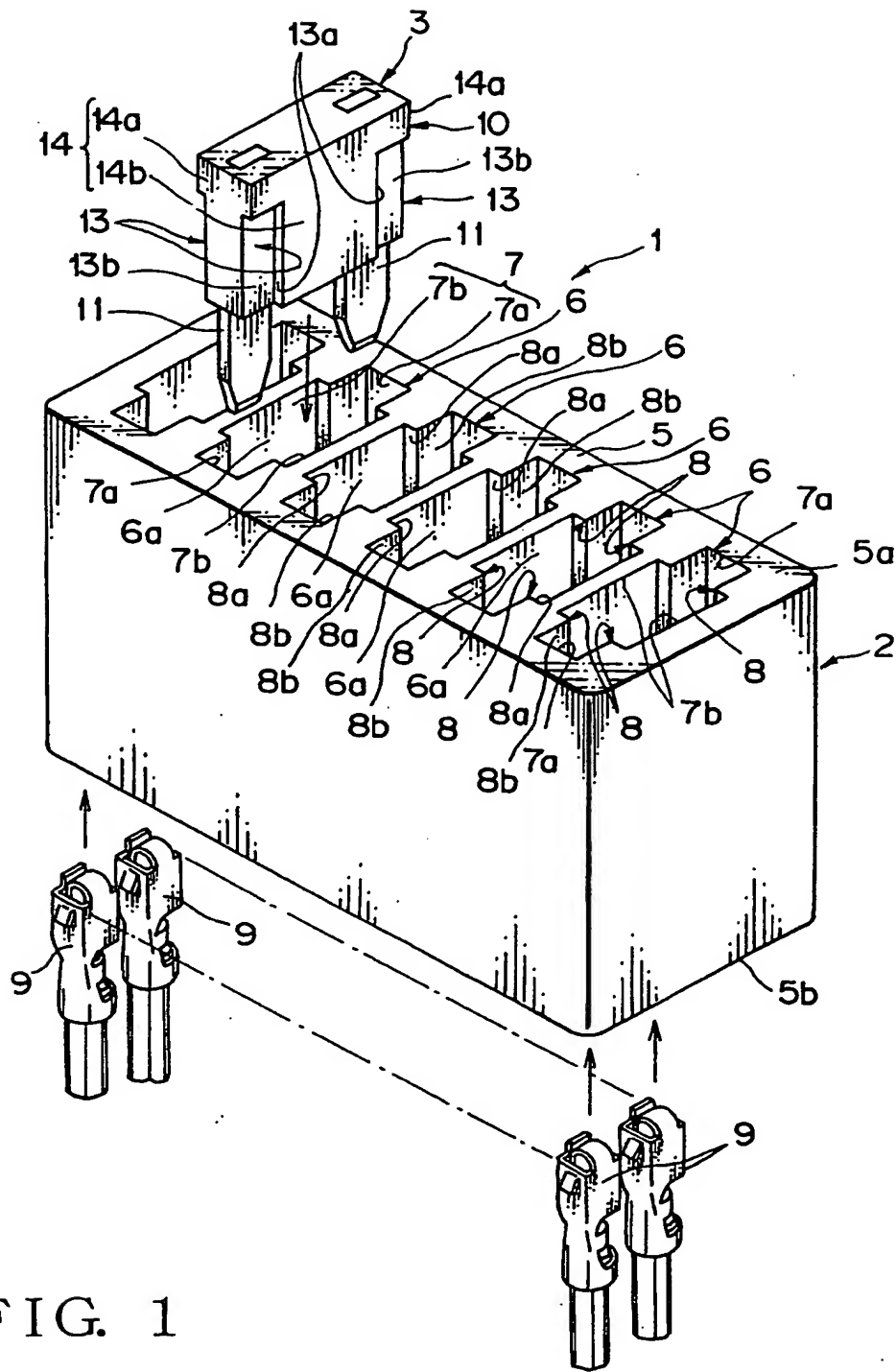


FIG. 2

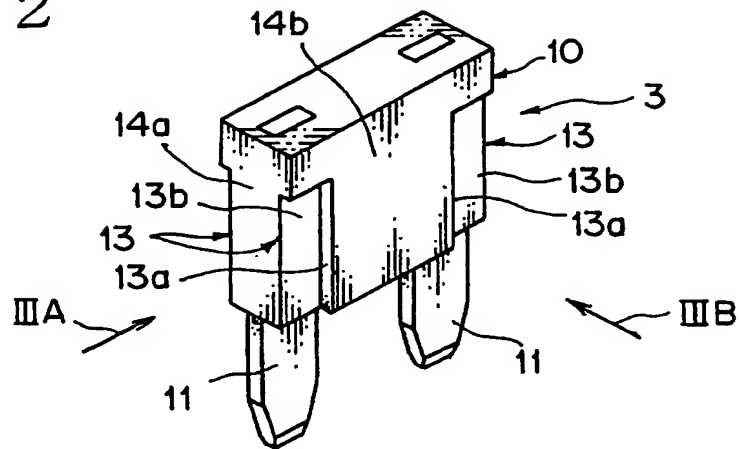


FIG. 3A

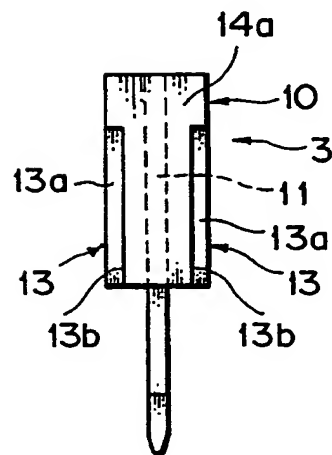


FIG. 3B

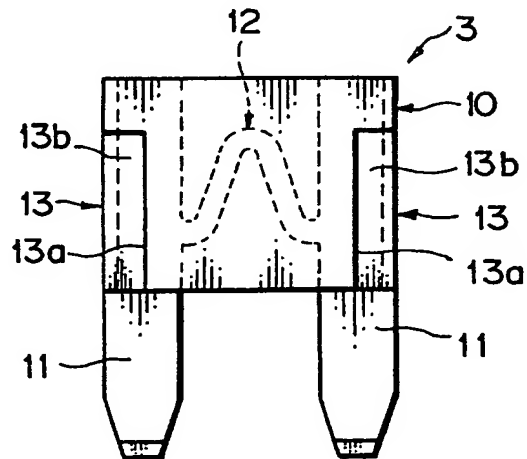


FIG. 4

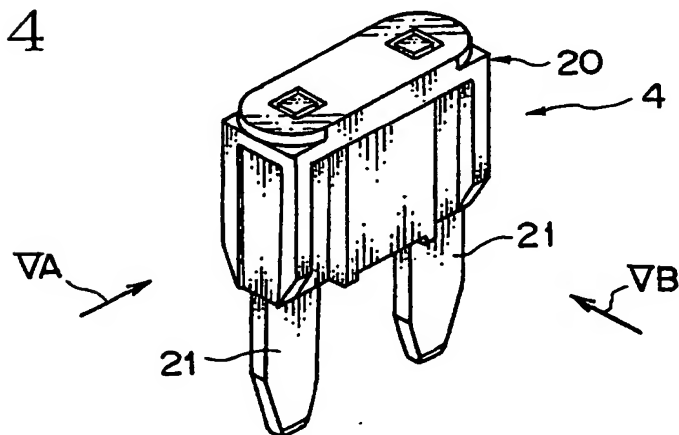


FIG. 5A

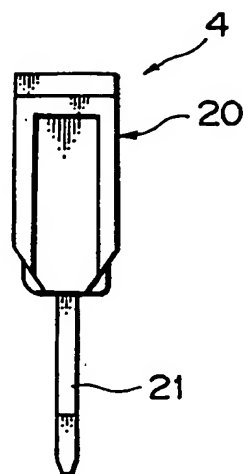


FIG. 5B

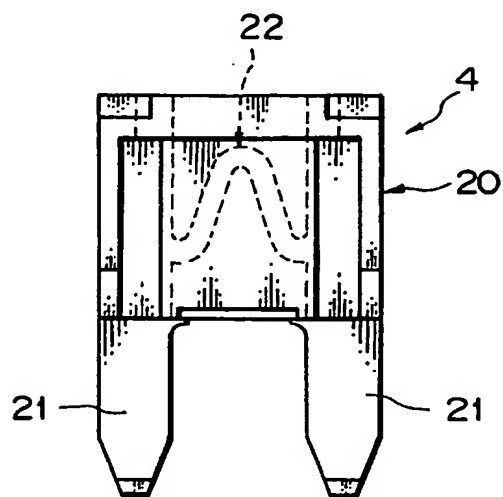


FIG. 6

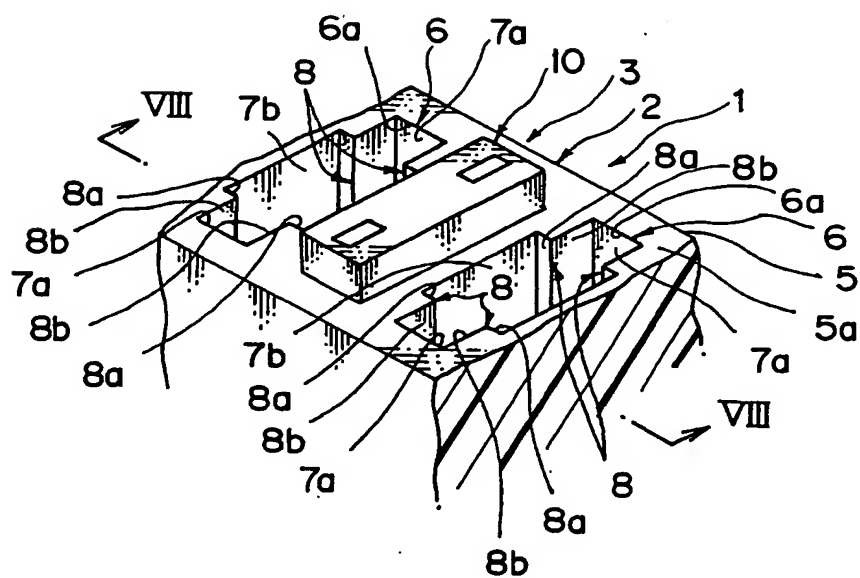


FIG. 7

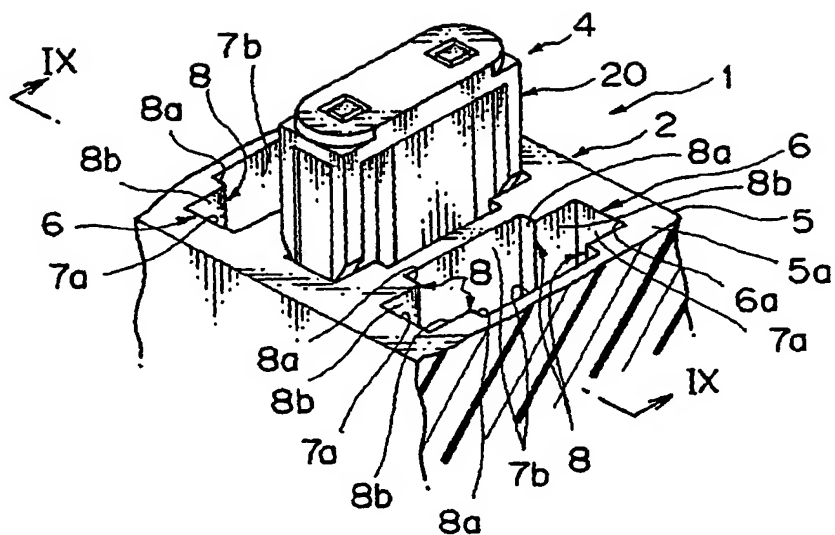


FIG. 8

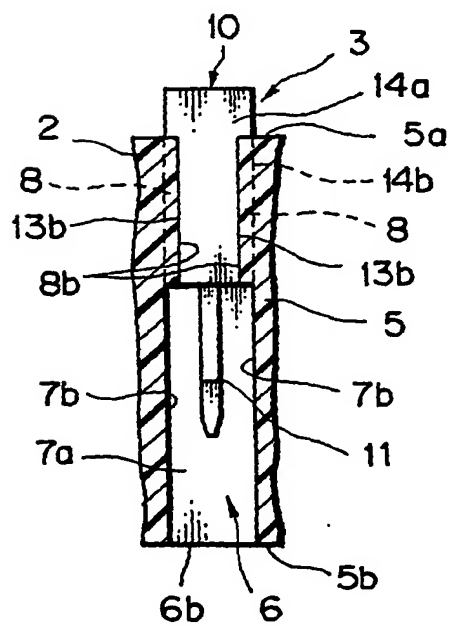


FIG. 9

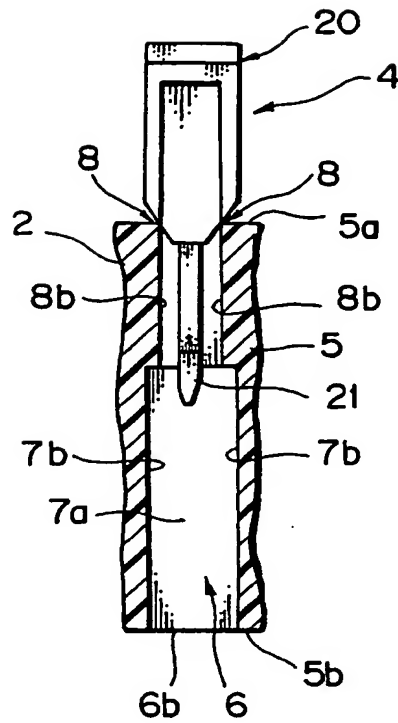
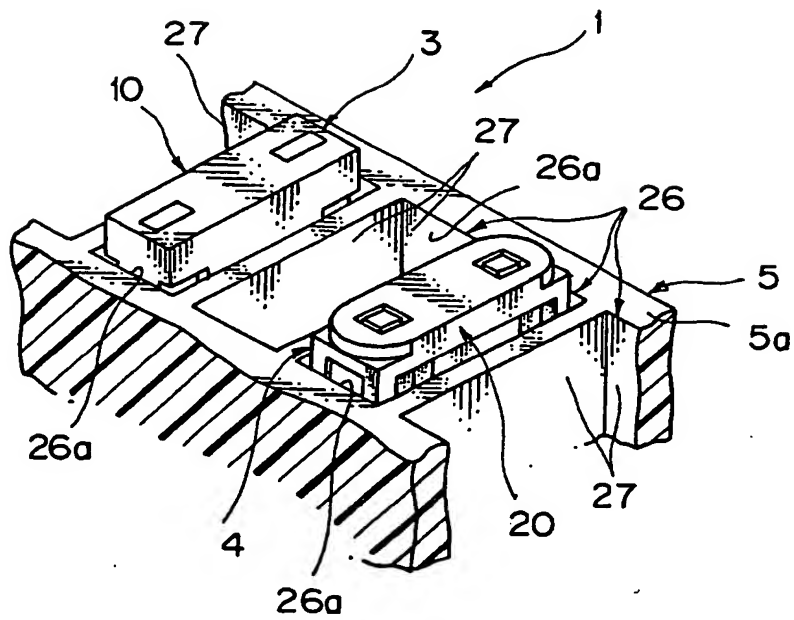
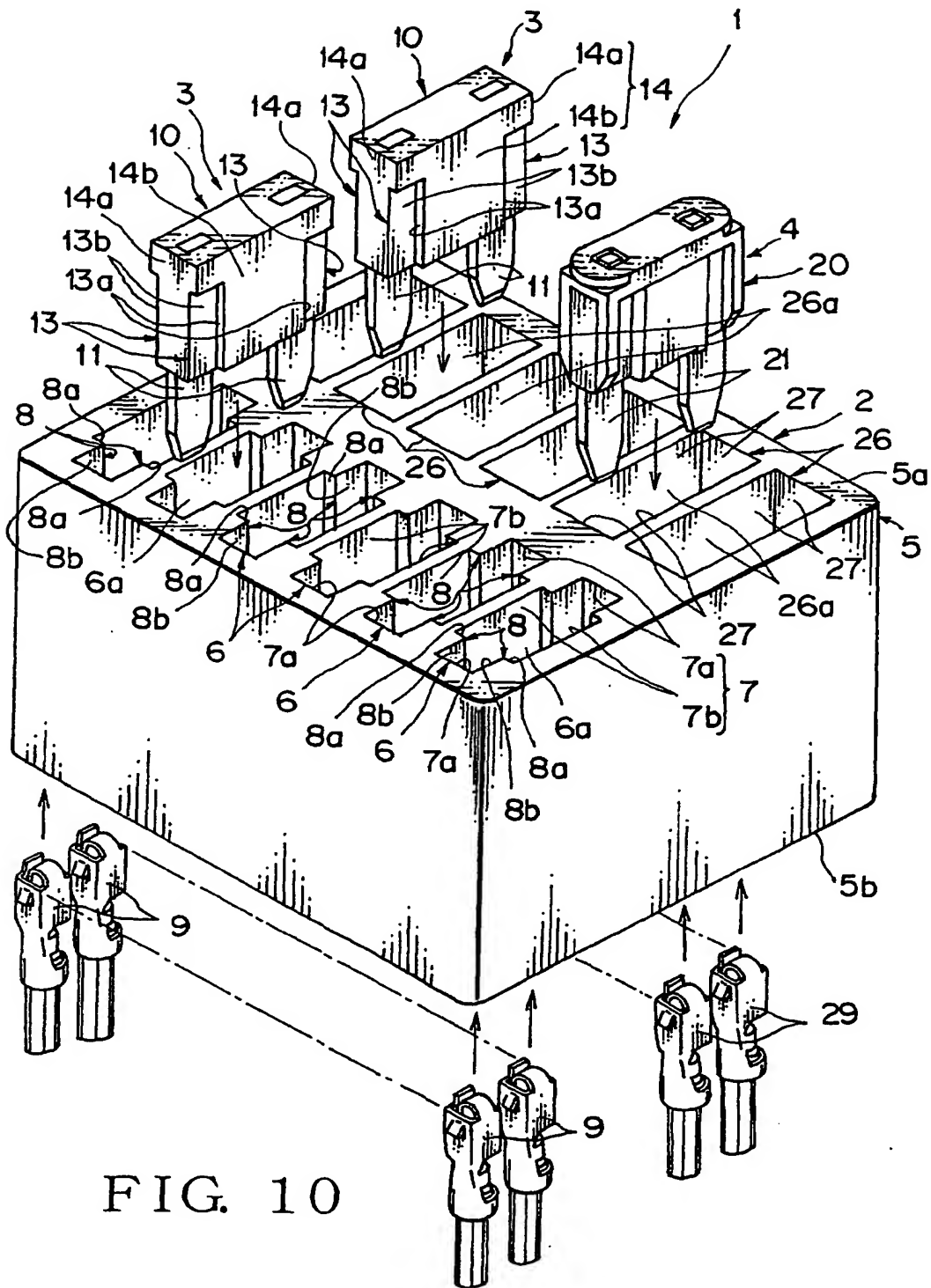


FIG. 11







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(54) Fuse box, fuse, and fuse block

(57) A fuse block 1 includes a fuse box 2 and a high voltage fuse 3. The fuse box 2 has a high voltage mounting part 6. The high voltage mounting part 6 is provided with an opening 6a, a plurality of surrounding walls 7a, 7b, and projections 8. Each of the projections 8 is projected from both the surrounding walls 7a, 7b which are adjacent to each other into an interior of the high voltage mounting part 6. A rated voltage fuse cannot be mounted to the high voltage mounting part 6 because of the presence of the projections 8. The high voltage fuse 3 includes a housing 10 having outer walls 14a, 14b and recesses 13. Each of the recesses 13 is formed by denting both the outer walls 14a, 14b which are adjacent to each other. When the high voltage fuse 3 is mounted to the high voltage mounting part 6, the recesses 13 and the projections 8 will not interfere with each other.

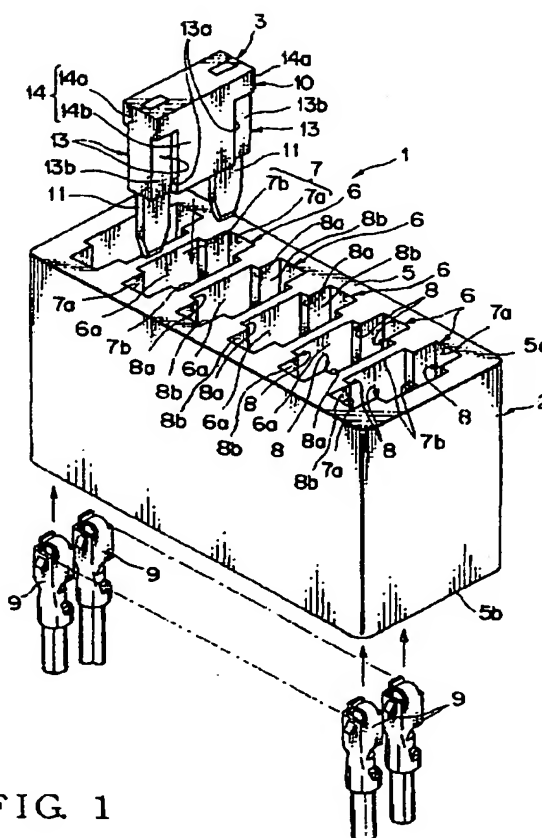


FIG. 1



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EUROPEAN SEARCH REPORT

Application Number
EP 01 10 7962

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Place of search THE HAGUE		Date of completion of the search 11 December 2002	Examiner Desmet, W
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